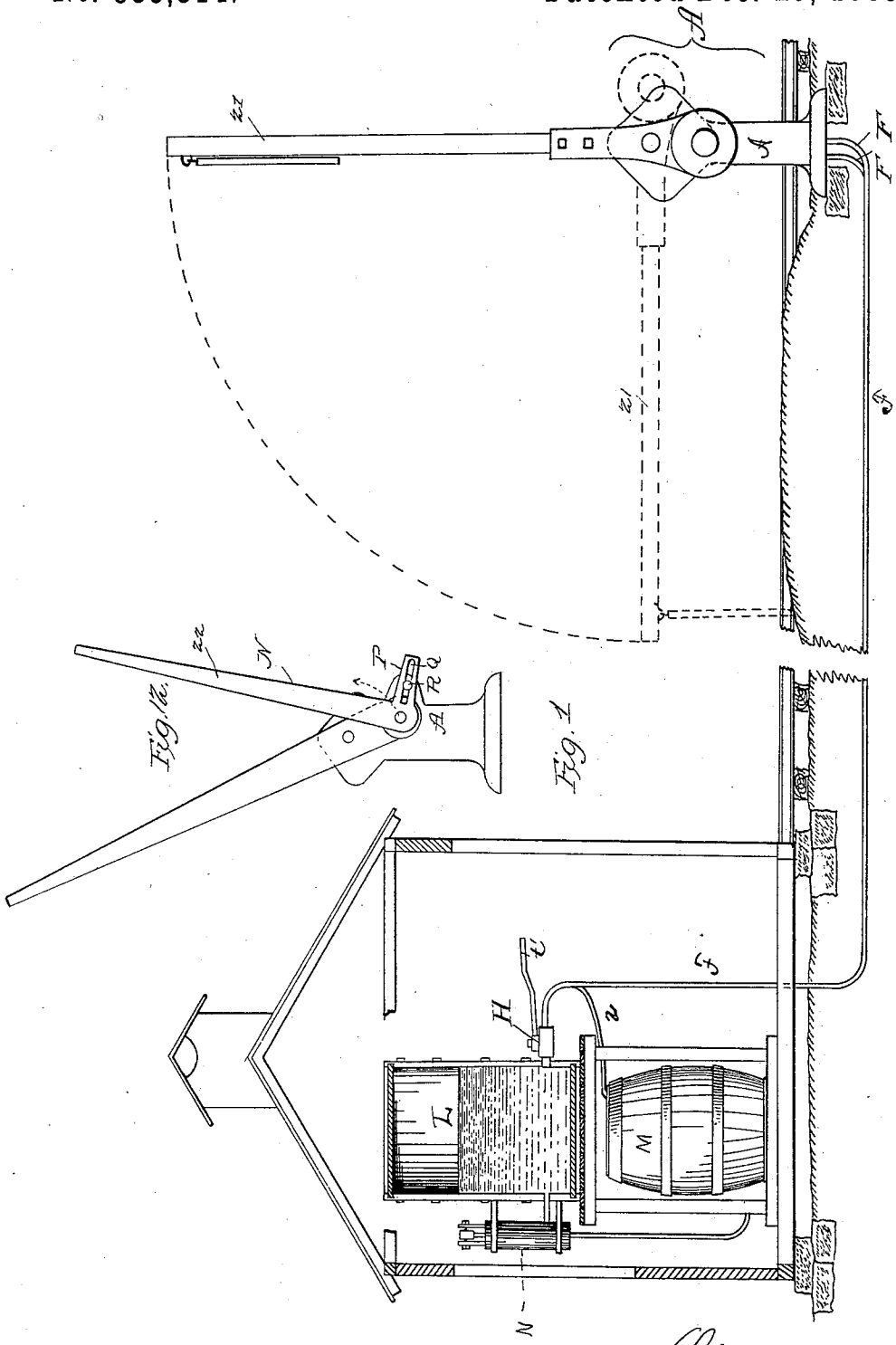
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J. A. LIDBACK.

HYDRAULIC RAILWAY GATE.

No. 333,314. Patented Dec. 29, 1885.



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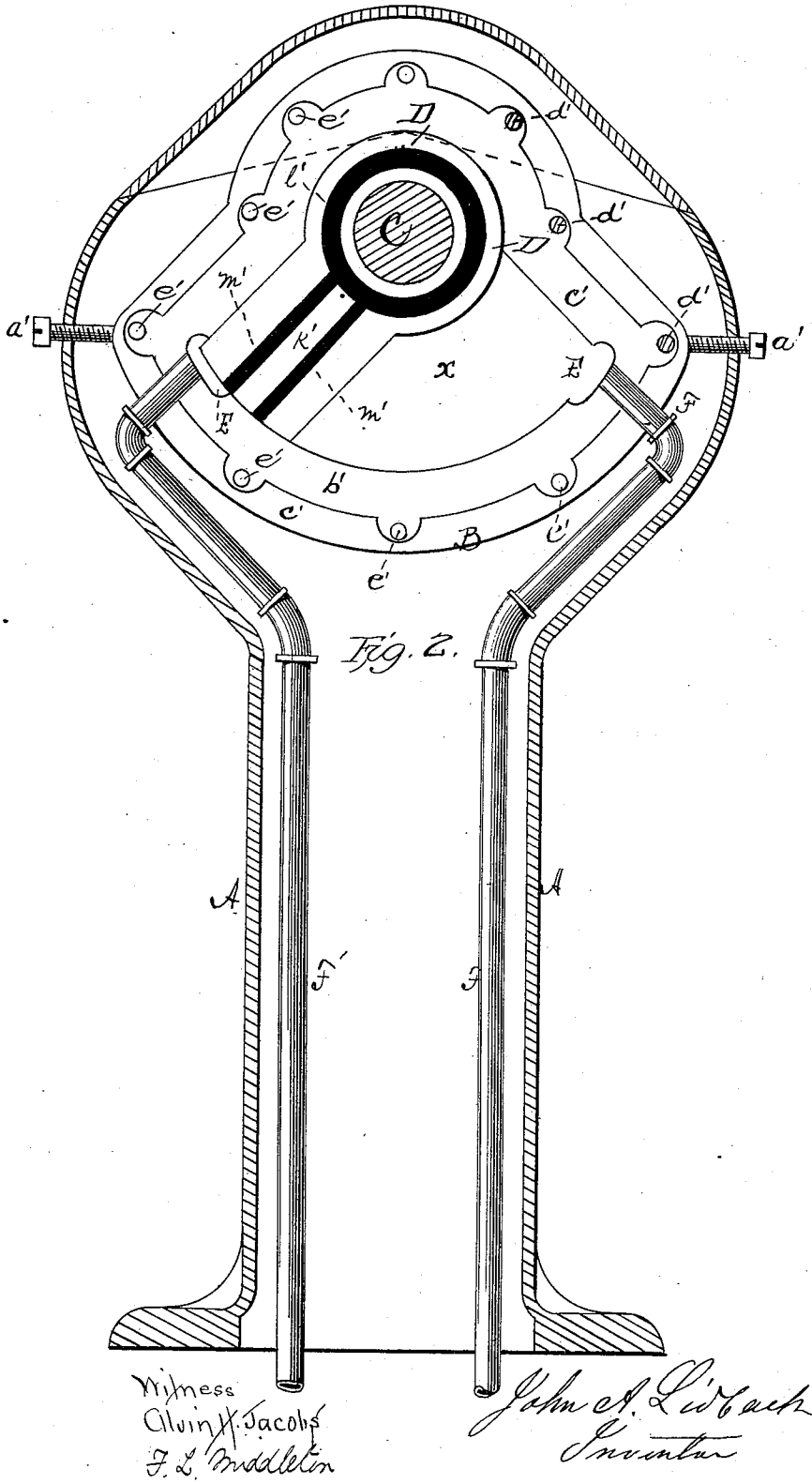


Fig. 2.

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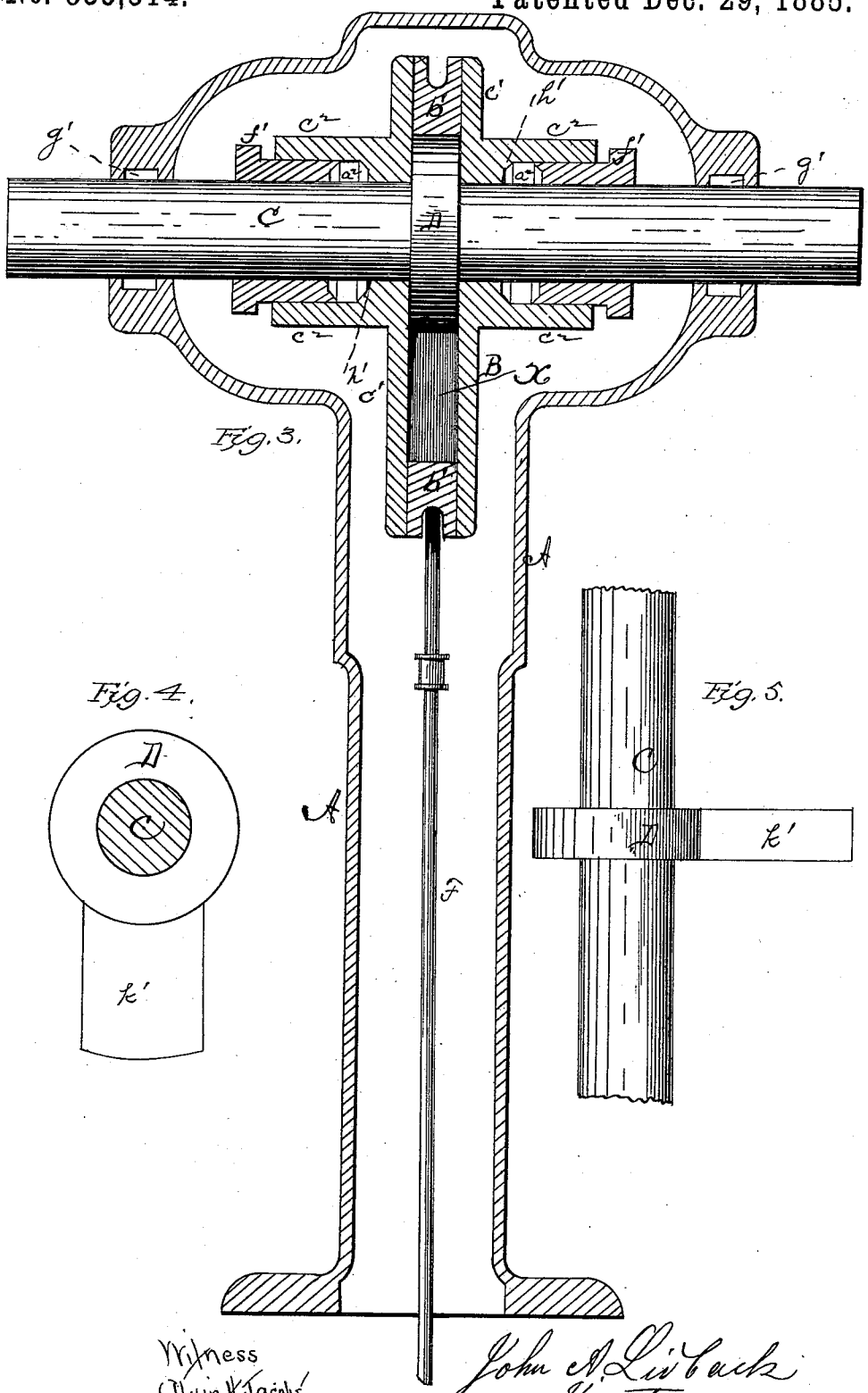


Fig. 3.

Fig. 4.

Fig. 5.

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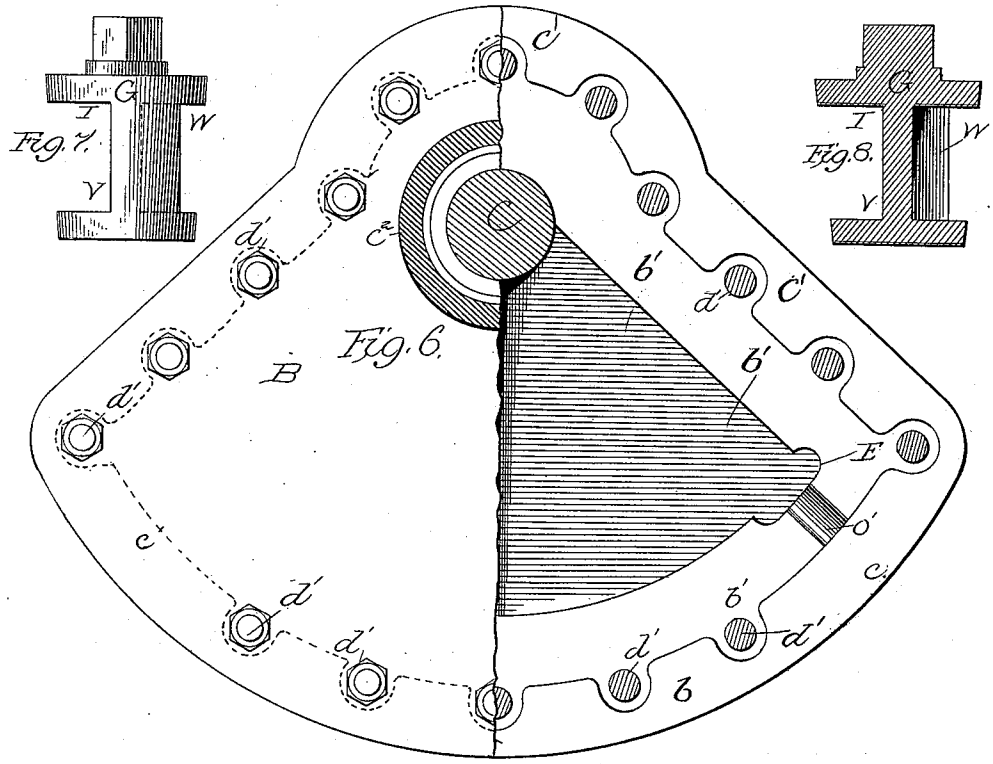
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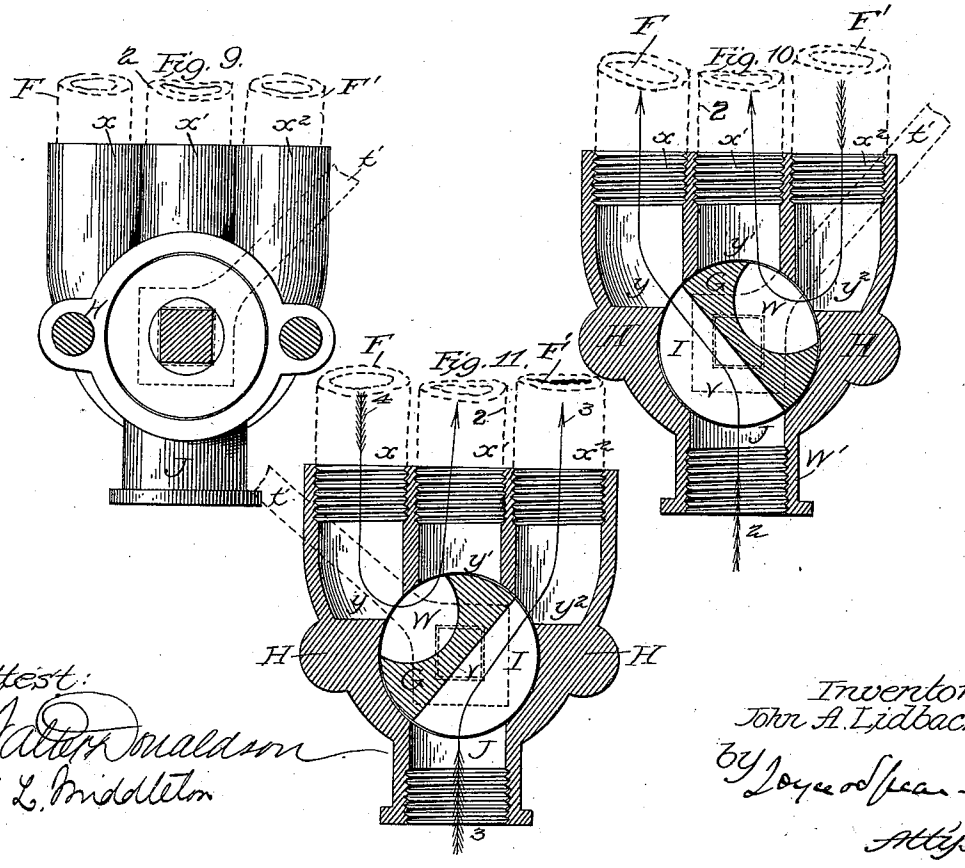
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UNITED STATES PATENT OFFICE.

JOHN A. LIDBACK, OF PORTLAND, MAINE, ASSIGNOR OF ONE-HALF TO JOHN J. GERRISH, OF SAME PLACE.

HYDRAULIC RAILWAY-GATE.

SPECIFICATION forming part of Letters Patent No. 333,314, dated December 29, 1885.

Application filed December 6, 1884. Serial No. 149,701. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. LIDBACK, of Portland, in the county of Cumberland and State of Maine, have invented a new and useful Improvement in Hydraulic Railway-Gates; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention has relation to certain new and useful improvements in the construction and operation of gates for railway-crossings, and has especial reference to what are commonly known as "vertically-swinging gates." The gate the subject of the present description is to be driven by hydraulic or other like power, the power to be operated from a gate-house situated at some convenient point more or less remote from the railway-crossing.

In the accompanying drawings, which form a part of this description, Figure 1 shows a view of a railway-crossing provided with the gate, also a gate-house from which the gate is operated. Fig. 2 shows a side view in vertical section. Fig. 3 shows an edge view in vertical section. Fig. 4 is an end view of the gate-bar shaft. Fig. 5 is a side view of the same. Fig. 6 shows a view of the hollow sector. Figs. 7 and 8 are details of the reversible valve. Figs. 9, 10, 11 are views of the reversible valve and valve-seat. Fig. 12 shows a view of the supplemental gate or tail bar.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A represents a case or gate-supporting stand, of which the top portion is movable, made, preferably, of metal castings, and connected to receive a hollow sector, B, which is secured in place and rendered firm within the supporting-stand A by means of proper set-screws, a' a'. The general construction of the supporting-stand A will be readily understood by the aid of the drawings without special description. The gate is shown at 21. The hollow sector B is made by taking a quadrant-shaped casting, b', Fig. 6, and placing at each side of it cast-iron segmental covers c' c', the several parts being held firmly in union by means of bolts d', passing through the covers c' c' and proper bolt-holes, e' e', in the quadrant b'. The covers c' c' are provided on their outer faces with projecting collars c^2 c^2, arranged to receive packing-glands f' f'. a^2 a^2 are metal packings between the ends of the glands f' f' and the covers c' c'.

The hollow sector B is pivoted on the shaft C, and is held in place in the stand A by the set-screws a' a', and may be moved by swinging on the shaft as a pivot. The method of fastening the sector in the stand is adapted to allow the sector, and thereby the gate, to be adjusted to any required position. In anti-friction bearings g' in the sides of the supporting-stand A is journaled a shaft, C, which carries the gate-bars. The shaft passes through the hollow sector B and through the packing-glands f' f'. Centrally located upon the shaft C and made integral with it is a boss, D, carrying a projecting abutment or oscillating piston, k', Fig. 2. The boss D and its abutment k' come within the hollow sector B and closely fit against the side walls thereof. The lower end of the abutment k' extends downward and fits closely against the inner face of the quadrant b'.

In order that a liquid-tight connection may be obtained between the boss D and abutment k' and the inner walls of the hollow sector, a circular channel is cut in the boss and filled with packing l', Fig. 2. Longitudinal channels are cut in the abutment and filled with packing-strips m' m'. The end of the abutment has similar packings bearing against the quadrant b'. For packing, wood is suggested, although any other suitable material can be used.

E E, Fig. 6, are small chambers in the angles on the inside of the quadrant b', each with a pipe-hole, o' o', Fig. 6. The chambers have pipes F F′ connected with them and extending downward through the stand A, as shown in Fig. 2. The pipes F F′ extend from the gate to the house, for the purpose of conducting the power to the gate.

In operating the gate the liquid is forced into one of the chambers E, strikes against the abutment k', and drives it to the other side of the quadrant. As the boss and abutment

are integral with the shaft C it is obvious that when the abutment is forced by the liquid to pass from one side of the hollow sector to the other the shaft must turn in its bearings, and the gate-bar carried by the shaft must also change its position to correspond with the movements of the abutment *k'*. By certain mechanisms at the power-point the direction of the power transmitted to the abutment *k'* through pipes F F' can be reversed and the abutment swung from side to side, at the will of the operator.

For a proper understanding of the reversing mechanism attention is called to Figs. 7, 8, 9, 10, 11, wherein are shown the full construction and operation of what has been denominated a "reversible valve." The valve seat and coupling consists of a single casting, H, and the valve is shown at G. Both G and H are castings made of some suitable composition metal. On the top of the valve G is a projecting stem. By taking hold of the stem with a suitable wrench, *t'*, the valve can be turned. The valve has an opening, I, cut in one side. This opening extends nearly to the axis of the valve and has a square face, *v*. On the opposite side the valve has a chamber, *w*. The valve-seat H has a hollow projection, J, internally screw-threaded, so that the seat can be screwed to a liquid-reservoir. On the opposite end the seat has three tubular projections, *x x' x²*, each internally screw-threaded, two of which, *x* and *x²*, are for connecting with the pipes F F', (extending to the hollow sector B,) and the third, *x'*, is for a discharge-pipe, 2, which leads to the receptacle for the returned liquid. Ports *y y' y²* connect the tubes *x x' x²*, respectively, with the opening in which the valve sits. When the pipe-connection *x* is in communication with the water-supply, as shown in Fig. 10, the other pipe-connection, *x²*, is open to the pipe-connection *x'*, leading to discharge-pipe 2, and when the valve is reversed the connections to the pipes F F' are likewise reversed.

Referring to Fig. 1, L shows a liquid-reservoir. The valve-seat is attached to the reservoir near the bottom. Beneath the reservoir L is seen a receptacle, M, for collecting returned liquid. N shows a force-pump, for raising the liquid from the receptacle M to reservoir L. The reservoir L is closed hermetically at the top, and is not entirely filled with liquid; but the liquid is forced in at the bottom, and as the level of the contained liquid rises the air above is compressed, thus adding air-pressure to the weight of the water.

To operate a gate by the above means, the valve is turned, for example, to the position shown in Fig. 10; the liquid from the reservoir L, following the direction of the arrow 2 2, passes through the tube *w'*, through the opening I in the valve, through the port *y*, thence through the pipe F into the hollow sector B, where it strikes against the abutment *k'* and swings it to the opposite side of the chamber X, and the gate is moved down and the railway-crossing closed.

To raise the gate and open the crossing, the valve is turned to the position shown in Fig. 11. The pressure of the air upon the level in reservoir L forces the liquid to follow the course of the arrow 3 3. The force extends through pipe F' to the sector and presses upon the abutment *k'*. This drives the liquid already in the chamber X back through the pipe F. The return-current, following the direction indicated by arrow 4, comes back through the pipe F, through the tube *x*, through the valve-chamber, thence into the return-tube connection *x'*, into the collecting-reservoir M.

The top of the stand A is movable, so that when occasion requires the parts contained within the stand can be got at and moved about.

In case the gate is to be used at a point where a sidewalk, as well as a roadway, is to be protected, the following additional construction is employed: A supplemental gate or tail bar, 22, is attached to the main bar. (See Fig. 12.) N shows the tail-bar. It is pivoted to the lower end of the main bar. At one side said bar N is provided with an arm, P, slotted at Q. A stud, R, projects from the stand A, and engages with the slot Q. Thus when the main bar is pivotally turned on the shaft C the tail-bar moves in the reverse direction, as shown in the figure referred to.

It will be seen that as the bar N is pivoted upon the end of the gate-bar proper it serves as a counter-balance therefor, and additional weight as a counter-balance will not be required where the gate-bars are of ordinary length.

In using the invention the inventor does not limit himself to the use of any special liquid. The device can be worked with water. In situations where the rigors of climate require, kerosene oil or some similar liquid should be used. Nor does he limit himself to the specific form of the devices, as he may use many equivalent forms, or forms substantially the same.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the supporting-stand, a hollow sector within said stand, a shaft to which the gate-arm is attached, mounted in bearings of said stand and carrying a piston or abutment working in the chamber of the sector, a pipe communicating with the chamber on each side of the oscillating piston, a pressure-tank, a valve seat and couplings connecting the pipes with said tank, a receptacle for the return liquid, a pipe connecting the coupling to the receptacle, said pipes all opening to the valve-seat, and a valve adapted to direct the liquid from the pressure-tank and piston-chamber, substantially as described.

2. The combination, with the main pivoted

bar of a railway-gate, of a supplemental counterbalancing-bar pivoted to the lower end of the said main bar, and having a slotted arm projecting at right angles from the pivot of said supplemental bar, and a fixed pin on the stand engaging with the slot, all substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN A. LIDBACK.

Witnesses:

CHARLES DUNN, Jr.,

MOSES L. SANBORN.